

Technical University of Denmark



## Performance of chemical herders for in situ burning of crude oil in ice infested waters

Adamopoulou, Eirini; van Gelderen, Laurens; Jomaas, Grunde

*Publication date:*  
2016

*Document Version*  
Peer reviewed version

[Link back to DTU Orbit](#)

*Citation (APA):*

Adamopoulou, E., van Gelderen, L., & Jomaas, G. (2016). Performance of chemical herders for in situ burning of crude oil in ice infested waters. Abstract from The 7th International Student Petroleum Congress & Career Expo "East meets West", Krakow, Poland.

## DTU Library

Technical Information Center of Denmark

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

# Performance of chemical herders for in-situ burning of crude oil in ice infested waters

---

Eirini Adamopoulou<sup>a,\*</sup>, Laurens van Gelderen<sup>b</sup> & Grunde Jomaas<sup>b</sup>

<sup>a</sup>*Department of Chemical Engineering, Technical University of Denmark, 2800 Lyngby, Denmark*

<sup>b</sup>*Department of Civil Engineering, Technical University of Denmark, 2800 Lyngby, Denmark*

<sup>\*</sup>*Speaker, email: s141496@student.dtu.dk*

In Situ Burning is an oil spill response technique with a good potential for remote and ice infested waters. Fire resistant containment booms are commonly used to collect and keep the oil slicks thick in open water. However, the presence of ice can make the fire booms' application more challenging. The herders are chemical surfactants that spread out to form a monolayer on the water surface resulting in compaction and thickening of the oil slick. Therefore, these herding agents could be a good alternative for accidents in ice infested waters. The effectiveness of the herder was studied with respect to the ignition and burning of oil slicks. Specifically, the average slick thickness, the distribution of slicklets on the water surface and the burning efficiency were studied as a function of different ice coverages (0%, 20%, 50%, and 80%). Experiments were performed in an intermediate scale water basin (16 m<sup>2</sup>) outdoors in Sisimiut, Greenland and in a small scale, indoor laboratory setup (1 m<sup>2</sup>) at DTU. A predetermined amount of crude oil (approximately 240 mL) was allowed to spread for 30 minutes and afterwards the herding agent was applied (150 µL/m<sup>2</sup> oil) in the vicinity of the edges of the water surface, and then allowed to herd the oil for 30 minutes. The average slick thickness of the herded oil reached up to approximately 5.5 mm and the oil slicks could easily be ignited. The chemical herders were proven to be efficient herding and thickening the oil up to the required ignition limit, however, the formation of multiple, individual oil slicks on the water surface because of the ice presence, made more complicated the ignition process and reduced the burning efficiency by 15-25%. The obtained results merit further research beyond the scope of the current investigation.